

**EXPERT PANEL**  
for  
**THE DICKSON COUNTY LANDFILL**  
**DICKSON, TENNESSEE**

**Memorandum**

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TO: Timothy V. Potter, Esq., Reynolds Potter, Ragan & Vandivort, PLC  
Michael K. Stagg, Esq., Waller Lansden Dortch & Davis, LLP  
Michael E. Wall, Esq., Natural Resources Defense Council, Inc.

FROM: David E. Jackson, P.G., P.H.  
David E. Langseth, Sc.D., P.E., D. WRE  
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MATTER: Natural Resources Defense Council, Inc., *et al.*, v. County of Dickson, Tennessee,  
*et al.*, No.: 3:08-cv-00229  
Consent Order Entered December 9, 2011

DATE: March 11, 2019

SUBJECT: Expert Panel Communication No. 15 - Installation of New Detection Monitoring  
Wells and Recommendations on USGS Wells within the EERA

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**INSTALLATION OF NEW DETECTION MONITORING WELLS**

In earlier communications, the Expert Panel for the Dickson County Landfill (the EP) selected 10 residential wells located outside but near the boundary of the Expanded Environmental Risk Area (EERA) for use as monitoring wells for detecting any potential future migration of landfill related contaminants beyond the boundaries of the EERA. Although information on the construction of these wells was not available to the EP, these wells are in-use wells, and the EP felt at that time that as such they are likely to provide reliable information on the quality of the groundwater in their vicinity.

As indicated by the EP during the December 12, 2018 teleconference, some problems with the use of these wells have arisen, the most recent one being the subdivision of the [REDACTED] property (MID 138) and the sale of the parcel where the detection monitoring well on this property was located. The EP does not know if the well continues, or will continue, to be an in-use well, but more importantly the EP is concerned that this, as well as other wells that are now used for detection monitoring, may not be suitable for such use in the future because the owner decides to connect to PWS or ceases to operate the well or for any other reason. The EP is, therefore, considering the replacement of these residential wells with ten new wells that will provide for detection monitoring around the EERA perimeter.

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The proposed locations for these detection monitoring wells are shown in Figure 1 and described on Table 1. These proposed well locations have been selected to be along local roads with the hope that they can be installed on the right-of-way of these roads without having to deal with private property owners. The EP requests that EnSafe, the County's consultant, field inspect these locations to determine whether they are suitable for the installation of detection monitoring wells, and if not, to propose alternate locations, within the general vicinity identified in Figure 1, that may be more suitable.

The EP also proposes that these wells are installed in two phases.

The first phase will consist of borehole installation and testing. The installation process will proceed as follows: (a) drilling a 10-inch hole through the regolith and onto the top of the underlying bedrock, (b) installing a 6-inch Schedule 40 PVC surface casing into the hole and grouting it to surface, (c) drilling a 5 7/8-inch hole through the surface casing into the bedrock to a depth of 300 feet, and (d) installing an 8-inch road cover with a concrete pad (see Figure 2). The regolith thickness at each proposed well location, as estimated from data presented in the 1984 United States Geological Survey (USGS) report on the groundwater resources of the area,<sup>1</sup> and the resulting bedrock drilling interval in each well are listed on Table 1.

After all the wells have been installed, a caliper, temperature, spinner-flowmeter, and a video survey should be conducted in each well to determine major flow zones and circulation patterns, if any, within the well. The EP will evaluate the results of this survey and, in consultation with the County's consultant, determine whether multiple depth intervals should be monitored in some, and possibly all, wells.

The second phase will consist of well completion based on the evaluation of the testing results from the first phase. The EP anticipates that during Phase II some, and possibly all, wells may need to be recompleted as "dual completion" wells by installing a 2-inch Schedule 40 PVC casing and screen assembly with a gravel pack around the screen and a bentonite/cement plug above the gravel pack<sup>2</sup> (see Figure 3). This will allow deeper flow zones of the bedrock to be monitored through the 2-inch casing and shallow bedrock flow zones through the annular space between the 6-inch and 2-inch casings. An alternate design, which can be used if there are concerns on the potential collapse of the upper bedrock and its prevention of sampling the annular space, is shown in Figure 4.

The EP requests that EnSafe obtains cost estimates from local contractors for completing the Phase I installation of the ten wells and for conducting the down-hole survey in each well. Cost estimates should also be developed for recompleting of a well as a dual-completion well either as shown in Figure 3 or as shown in Figure 4.<sup>3</sup>

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<sup>1</sup> Bradley, M. W., 1984, *Groundwater in the Dickson Area of the Western Highland Rim of Tennessee*, USGS Water-Resources Investigations 82-4088, prepared in cooperation with the Tennessee Division of Water Resources and the City of Dickson Tennessee, Nashville, Tennessee.

<sup>2</sup> The plug will be placed at a competent interval of the bedrock as determined from the survey results.

<sup>3</sup> For these double-completion cost estimates, assume the bentonite/cement plug separating the lower and upper monitoring intervals to be 50 feet long and the average screen length to be 90 feet.

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## RECOMMENDATIONS ON USGS WELLS WITHIN THE EERA

During an investigation of the groundwater resources in the Dickson area, conducted in the early 1980's by the USGS in cooperation with the Tennessee Division of Water Resources and the City of Dickson<sup>1</sup>, Tennessee, 26 test wells were installed in Dickson County and the vicinity of the landfill.<sup>4</sup> Fifteen of these wells are located within the boundaries of the EERA (see Figure 5). Of the USGS wells shown on Figure 5, DK-12 was reported by the USGS as having been destroyed, and DK-9 is actively used as part of the Dickson county Landfill monitoring program. During a recent investigation<sup>5</sup> conducted by EnSafe at the request of the EP, EnSafe was able to locate 10 of the remaining 13 wells,<sup>6</sup> and sampled 6 of the located wells. (Two wells could not be sampled because they have been apparently filled with gravel, and another two could not be sampled because obstructions prevented the installation of the passive diffusion bags (PDBs) that were used for sampling.

The EP's recommendations on the disposition of these wells are as follows:

1. Well DK-9 should continue to serve as a monitoring well for the landfill monitoring program;
2. Well DK-15, located near the center of the EERA and showing the presence of landfill related contaminants, should be added to the EERA semi-annual sampling program to provide information on future conditions within the EERA;
3. Well DK-22 is located close to location 7 for a proposed new detection monitoring well (see Figures 1 and 5). During the October 2018 survey, this well was found to have an obstruction at 3.5 feet but this did not prevent its sampling. The EP recommends that the well be evaluated to determine whether this obstruction can be removed. If the obstruction can be removed, than a further evaluation should be made by conducting a caliper, temperature, spinner-flowmeter, and video survey to determine whether the well can serve as a detection monitoring well in lieu of the proposed new well at location 7.<sup>7</sup> Decisions on further actions for this well and on the installation of the new well at location 7 will be based on the results of this evaluation; therefore, the evaluation of this well is a high priority item that must precede detection well installation activities.

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<sup>4</sup> See Table 4 in Bradley (1984), the document cited in Footnote 1.

<sup>5</sup> Memorandum dated October 31, 2018 from Shaun Winter, PG and Cody Munday, PG of EnSafe Inc. to Expert Panel for the Dickson County Landfill, with subject *October 2018 Sampling of U. S. Geological Survey Wells within the Expanded Environmental Risk Area*.

<sup>6</sup> Wells DK-16, DK-18, and DK-25 were not found in the field. They are plotted in Figure 5 at locations estimated from Figure 15 in Bradley (1984), the document cited in Footnote 1.

<sup>7</sup> The well is reported as being cased to 134 feet and "open hole" 134-300 feet; thus, its depth and casing are consistent with that proposed for the new detection monitoring wells, and depending on its diameter, it could be recompleted as a dual-completion well, if necessary, or as a 2-inch monitoring well for the deeper bedrock that can be paired with a new monitoring well for the shallow bedrock.

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4. The remaining USGS wells that were located within the EERA, and any other EERA/USGS wells that may be located in the future, should be plugged and abandoned. Additionally, any structures associated with these wells should be removed and the landscaping restored to a condition similar to the surrounding landscaping. Further, if feasible, the wells should be cut off at least one foot below ground surface so that no evidence of the well remains visible at the surface.

The EP has also considered whether, and if so how much, the owners of the properties on which the USGS wells are located should be compensated for access to the USGS wells that are to be plugged and abandoned. The EP believes that some compensation is justified, but does not believe that the compensation should be at the same level as that paid to the owners of residential wells who agree to the plugging and abandonment of their well if they are, or after they are, connected to PWS. The residential supply wells are an asset with tangible value for which the property owner paid, either in direct installation cost or embedded in the price of the property when purchased. In contrast, the property owners did not pay for the USGS well installation; in fact, it is possible that they have been paid a certain amount to allow the installation of a test well on their property. Further, the USGS wells do not constitute a property asset with tangible value. In consideration of these various factors, the EP recommends compensation at the level of \$1,000 per property in return for agreement to allow access to plug and abandon any and all USGS monitoring wells on that property.

Attachments: (Figures 1-5 and Table 1)

cc: Mayor Bob Rial, City of Dickson  
Mr. Shaun Winter, EnSafe  
Ms. Cecilia Segal, NRDC